



TITLE OF THE INVENTION

IMAGE FORMING APPARATUS AND DATA OVERWRITING METHOD

BACKGROUND OF THE INVENTION

5 The present invention relates to an image forming apparatus, which can execute data overwrite by receiving data from outside, and to a data overwriting method.

10 In the prior art, when data overwrite is performed in an image forming apparatus, a controller first compares the version of data, which is stored in a storage device in a processing section of the image forming apparatus, with the version of data for the storage device in the processing section, which is located on a Web site. When the version of the data on  
15 the Web site is a later one, the controller acquires the data from the Web site and delivers it to the image forming apparatus. In the image forming apparatus, the data in the storage device of the associated processing section is overwritten.

20 In the controller or the image forming apparatus, data in storage devices in respective processing sections is overwritten in succession. For example, data in a system processing section is first overwritten, data in a scan processing section is  
25 secondly overwritten, data in a print processing section is thirdly overwritten, and data in a finisher processing section is fourthly overwritten.

In this overwrite method, however, if data  
overwrite fails during the data overwrite operation, or  
if power is disrupted during the data overwrite, there  
would be such cases that data is lost and normal  
5 operation cannot be started even if the apparatus is  
rebooted or power is turned on again.

In addition, when specific data is overwritten,  
mismatching would occur in data between respective  
processing sections and there would be such cases that  
10 normal operations cannot be started even if the  
apparatus is rebooted or power is turned on again.

In particular, when the configuration of an option  
processing section, which is associated with a device  
connected to the image forming apparatus, is altered,  
15 normal operations cannot be performed in many cases.  
For example, a communication error occurs due to  
mismatching of data between respective processing  
sections.

#### BRIEF SUMMARY OF THE INVENTION

20 The object of an aspect of the present invention  
is to provide an image forming apparatus and a data  
overwriting method, which can prevent mismatching of  
data between respective processing sections due to  
failure of data overwrite, disruption of power during  
25 data overwrite, a change after data overwrite or  
a change in a device included in the image forming  
apparatus.

According to an aspect of the present invention,  
there is provided an image forming apparatus capable of  
receiving data from outside and executing data  
overwrite, comprising: a plurality of processing  
5 sections that include storage devices storing data  
associated with the respective sections of the image  
forming apparatus, and executes control based on the  
data stored in the storage devices; a storage section  
that stores basic data and overwrite data thereof,  
10 which is stored in the storage devices of the  
processing sections; a receiving section that receives  
overwrite data from the outside; a first control  
section that executes a control to store the data  
received by the receiving section in the storage  
15 section; an overwrite section that overwrites the data  
in the storage device of the associated processing  
section, using the data received by the receiving  
section; a confirming section that confirms whether the  
image forming apparatus operates with a combination of  
20 the data stored in the storage devices immediately  
after the overwrite section overwrites the data or  
immediately after power to the apparatus is turned on;  
and a second control section that executes, when the  
confirming section confirms that the image forming  
25 apparatus fails to operate, a control to overwrite the  
data in the storage devices on the basis of the basic  
data and overwrite data stored in the storage section,

thereby to realize a latest, optimal combination of data.

According to another aspect of the present invention, there is provided a data overwriting method  
5 for an image forming apparatus capable of receiving data from outside and executing data overwrite, comprising: controlling respective sections, which form the image forming apparatus, on the basis of data stored in storage devices associated with the  
10 respective sections; storing basic data and overwrite data thereof, which is stored in the storage devices, into an external storage device; executing, when overwrite data is received from the outside, a control to store the received data in the external storage  
15 device; overwriting the data in the associated storage device, using the received data; confirming whether the image forming apparatus operates with a combination of the data stored in the storage devices immediately after the data is overwritten or immediately after  
20 power to the apparatus is turned on; and executing, when it is confirmed that the image forming apparatus fails to operate, a control to overwrite the data in the storage devices on the basis of the basic data and overwrite data stored in the external storage device,  
25 thereby to realize a latest, optimal combination of data.

Additional objects and advantages of an aspect of

the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of an aspect of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the embodiments given below, serve to explain the principles of an aspect of the invention.

FIG. 1 is a block diagram schematically showing the structure of an image forming apparatus according to the present invention;

FIG. 2 is a flow chart illustrating an operation when data overwrite is requested; and

FIG. 3 is a flow chart illustrating a reboot operation immediately after overwrite of specific data or a boot operation immediately after power is turned on.

#### DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention will now be described with reference to the accompanying drawings.

FIG. 1 schematically shows the structure of an image forming apparatus according to the present invention. An image forming apparatus 20 comprises a system processing section 2, a scan processing section 4 and a print processing section 6. A controller 1 is connected to the image forming apparatus 20 via an interface (I/F) 13. In addition, an option processing section 9 is connected to the image forming apparatus 20.

The controller 1 is connected to a Web site 12 that provides data via the Internet 14. As will be described later in detail, the controller 1 acquires data from the Web site 12 that provides data.

The system processing section 2 includes a storage device 3 comprising a non-volatile memory. An external storage device 8 is connected to the system processing section 2. The system processing section 2 controls the entirety of the apparatus. The external storage device 8 is, for instance, a hard disk drive. The external storage device 8 prestores, at the time of shipment, a table containing basic data and version information thereof.

The scan processing section 4 includes a storage device 5 comprising a non-volatile memory and performs an operational process for a scanner (not shown).

The print processing section 6 includes a storage device 7 comprising a non-volatile memory and performs

an operational process for a printer (not shown).

The option processing section 9 performs operational processes for a finisher processing section 10 that includes a storage device 11 comprising  
5 a non-volatile memory, and an automatic document feeder (ADF) (not shown).

Normally, when data overwrite for the image forming apparatus 20 is performed, the controller 1 acquires data from the Web site 12 that provides data  
10 via the Internet 14. The controller 1 transmits the acquired data to the image forming apparatus 20 via the interface (I/F) 13.

With the above-described structure, the operation of the image forming apparatus 20 at the time when data  
15 overwrite is requested is described with reference to a flow chart of FIG. 2.

When a request for data overwrite is issued from the controller 1, the system processing section 2 of the image forming apparatus 20 receives data (ST1).

20 The system processing section 2 stores the received data, along with version information of the data, in the external storage device 8 (ST2).

The system processing section 2 writes the received data into the storage device (3, 5, 7, 11) of  
25 the associated processing section (ST3).

The system processing section 2 executes reboot and finishes the process (ST4).

Next, referring to a flow chart of FIG. 3,  
a description is given of a reboot operation  
immediately after the controller 1 executes overwrite  
of specific data in the image forming apparatus 20, or  
5 a boot operation immediately after power to the image  
forming apparatus 20 is turned on.

At the time of start of the reboot operation or  
boot operation of the image forming apparatus 20, the  
system processing section 2 confirms whether the  
10 configuration of the option processing section 9 has  
changed (e.g. addition of an option device), and  
whether data in the storage device 3, 5, 7, 11 in each  
processing section has changed (e.g. overwrite) (ST11).  
If there is no change in step ST11, the system  
15 processing section 2 finishes the confirming process.

If there is a change in step ST11, the system  
processing section 2 confirms whether there is a  
problem with the combination of data in the current  
configuration, for example, disability of normal  
20 activation of the apparatus (ST12). If there is no  
problem in step ST12, the system processing section 2  
finishes the confirming process.

If there is a problem in step ST12, the system  
processing section 2 overwrites the data in the storage  
25 devices 3, 5, 7, 11 in the respective processing  
sections by using the data stored in the external  
storage device 8, thereby to realize a latest, optimal



combination of data in the current configuration (ST13). Thus, the system processing section 2 prevents occurrence of problems.

5       The system processing section 2 then executes reboot and finishes the process (ST14).

10       As regards the determination of whether the data combination is latest and optimal, when overwrite data is received from the controller 1 at the time of data overwrite, data (version information, etc.) indicative of the data combination is also received at the same time and stored in the external storage device 8. The system processing section 2 refers to the data indicative of the data combination, thereby executing the determination of whether the data combination is latest and optimal.

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      The controller 1 also acquires the data indicative of the data combination from the Web site 12 that provides data via the Internet 14.

20       Normally, each processing section is activated by referring to data stored in the storage device thereof. There are cases, however, where an error occurs due to a problem with a combination of data in the respective processing sections and the image forming apparatus cannot normally be operated. The present invention aims at preventing this.

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      This invention is also applicable to reboot and boot operations in case of, e.g. failure of data

overwrite and disruption of power during data  
overwrite.

As has been described above, according to the  
embodiment of the present invention, when the image  
forming apparatus cannot normally be activated due to  
5 failure of data overwrite or disruption of power during  
data overwrite, the image forming apparatus itself  
executes data overwrite in the storage device that  
cannot normally be started up, with use of data for the  
10 storage device stored in the external storage device.  
Thereby, an optimal data combination is realized, and  
the apparatus can normally be activated.

As regards the option processing section of the  
image forming apparatus, there is a case where  
15 mismatching occurs when an option device different from  
a currently connected option device is connected and  
power is turned on once again. In such a case, the  
image forming apparatus itself executes data overwrite  
in the storage device, with which mismatching has  
20 occurred, with use of data for the storage device  
stored in the external storage device. Thereby,  
an optimal data combination is realized, mismatching is  
eliminated, and the apparatus can normally be  
activated.

25 Additional advantages and modifications will  
readily occur to those skilled in the art. Therefore,  
the invention in its broader aspects is not limited to

the specific details and representative embodiments  
shown and described herein. Accordingly, various  
modifications may be made without departing from the  
spirit or scope of the general inventive concept as  
5 defined by the appended claims and their equivalents.